ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Research Article

ROLE OF *POTAKI MOOLA KALKA LEPANA* IN *PRASAVA* (1ST STAGE OF LABOUR): A COMPARATIVE STUDY

Shreyes. S[1], Vandana.S.Kulkarni[2], Jyothi. S. Kanagali[3], Yogitha Bali M.R[4]*

[1]Assistant Professor, Dept of Prasooti Tantra & Stree roga, Government Ayurvedic Medical College, Bangalore,

[2]Professor and HOD, Dept of Prasooti Tantra & Stree roga, Shri. J.G.C.H.S, Ayurvedic Medical College & Hospital, Ghataprabha,

[3]Consultant Obstetrician & Gynaecologist, Shri J G Co-operative Society's Hospital, Ghataprabha.

*[4]Professor, Dept of Shalya Tantra, Sushrutha Ayurvedic Medical College, Bangalore.

ABSTRACT

Pregnancy, parturition and puerperium are the three main stages occurring during active reproductive period of a woman's life. Among them, parturition is the stage that needs highest attention. Labour is a nature's process. Very often it requires minimal assistance. However, due to altered anatomy and physiology a perfectly normal labour may suddenly become abnormal and even fatal. **Objectives:** To evaluate the effect of *Potaki Moola Kalka Yoni Lepana* in *Prasava* (First stage of labour) **Design:** This was a randomized controlled study with thirty patients divided into two groups, 15 in each. In Group A, Prostaglandin E2 (Dinoprostone gel) was administered vaginally for maximum of 3 doses with a gap of 6hrs and in Group B, *Pothaki moola kalka* application was done was vaginally for maximum of 3 *Lepa* application with a gap of 6hrs. **Results:** Statistically significant results were seen in cervical dilatation, cervical effacement, cervical position, cervical consistency and head station components of Bishop's score in the first stage of labor with $p<0.05$. **Conclusions:** Group B showed statistically significant results in cervical dilatation, cervical effacement, cervical position, cervical consistency, head station etc, components of Bishop's score in the first stage of labor compared to Group A.

KEYWORDS: *Prasava*, 1st Stage of Labour, *Potaki Moola Kalka Lepana.*

INTRODUCTION

Maternal mortality is unacceptably high. About 830 women die from pregnancy or childbirth related complications around the world every day. It was estimated that in 2015, roughly 303000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented.[1] Pregnancy is the most important event in the life of every woman. Passage throw the birth canal is the most hazardous journey made by an individual in his or her life, the amount of pain and discomfort a woman has to face is far more than any pain imaginable. The risk and agony is enormously increased when labor is prolonged and the mother faces agonizing pain there is anxiety and fear of operative interventions. So to minimize this and to get a healthy child proper knowledge of process of labour is essential.[2]

The diagnosis of labor onset has been described as one of the most difficult and important judgments made by providers of maternity care.[3] The first stage of labor, through effective uterine contractions, achieves the objective of shortening or effacing the cervix, and opening or dilating it to at least 10cm in diameter to allow the passage of the infant from the uterus to the vagina. It is comprised of two phases; latent and active. There is compelling evidence that the durations of both latent and active phases of labor are clinically relevant and thus require consistent approaches to measurement. A prolonged latent phase of labor has been associated with an increased risk for oxytocin augmentation of labor, caesarean section, meconium staining in the amniotic fluid, 5-min Apgar score less than 7, need for newborn resuscitation and admission to the NICU.[4,5]

Women who are admitted to labor wards in the latent vs. active phase of labor are at higher risk for obstetrical intervention including electronic fetal monitoring, epidural analgesia, oxytocin, and caesarean section.[6,7,8,9] There may also be important differences in durations of latent and active phase

labor and their relationship to obstetric outcomes according to parity.

Despite research pointing to the importance of the duration and transition between the latent and active phases of labor, there is considerable inconsistency in definitions of labor onset, a necessary component of measuring duration. The onset of the latent phase of labor has been defined as the time of the first clinical assessment in labor at the hospital,[5,7] or alternatively the beginning of strong regular painful contractions.[4]

An elaborate description of *Prasava* is given in Ayurvedic *samhitas* which help us tremendously to understand concept of *Prakrit prasava* (normal labour). People are not aware of concept of labour in Ayurveda though it is a very scientifically described in Ayurvedic texts. The term *'Prasava'* is derived from *'Shuyan Prani Prasave'* by prefixing "*Pra*" and applying *Panini Sutra* "*Ridrop*". The term '*Prakrit prasav'* (normal labour) is applicable to *Svabhavika*- spontaneous onset, *Upasthitha kala*- onset on completion of term, *Avaksira*- Cephalic presentation, *Svabhavika kala*- Without undue prolongation and *Upadravarahita*- Without having any complications. At the onset of labour the head of the foetus gets turned and comes forward due to the action of *Prasuti Maruta* and then is expelled out through *Apatyapatha* (birth canal). This is termed as "*Prakrita Prasava*" (normal labour).[2]

A brief regimen for each and every step (*Prasava Paricharya*) is also explained in texts which help to prevent any untoward phenomenon during labour. By having the exact knowledge of process and mechanism of labour and following the *Prasava paricharya* complications can be prevented. But as there are no much clinical studies on the *Prasava* or the labour that is described in Ayurvedic texts, the present study was carried out to evaluate the efficacy of *Potaki moola kalka* application in the first stage of labour.

MATERIALS AND METHODS

Patients were selected from the IPD of Prasooti tantra and Stree roga, Shri. J.G.C.H.S, Ayurvedic Medical College & Hospital, Ghataprabha. This was a single blind clinical study followed with simple randomized sampling method after thorough physical and lab investigations. 30 Primigravida patients of active reproductive age between 28 to 35yrs, pregnant woman in true labour, with average height of 145 to 170cms, average weight of 40 to 60kgs, with haemoglobin 10.5gm% or more and with negative VDRL, HbSAg and HIV tests were included for the study.

Primigravida patients above 35 years of age, Multigravida patients, with height less than 145cms (short stature), having haemoglobin less than 10.5gms%, with anatomical pelvic abnormality, CPD, mal presentation, placenta previa, APH, over weight > 80kgs, cases having pathology of reproductive system like fibroids, fothergill repair, high risk pregnancies including jaundice, pre-eclampsia, eclampsia, twins, PIH etc, cases of systemic disorders like T.B., diabetes, Asthma, cardiac disorders, Hypertension (130/90mm of Hg or more) and Renal diseases etc were excluded.

Assessment Criteria

Outcome of *Prathama Avastha* of *Prasava* was observed, assessed and was compared with the standard group. Progress of labor was assessed on standard parameters of Bishop's score & Partogram.

Gradation of assessment parameters

a) Cervical Dilatation

i. 3 = 2 cm – 3 cm
ii. 2 = 4 cm – 5 cm
iii. 1 = 6 cm – 8 cm
iv. 0 = 9 cm – 10 cm/ full dilatation

b) Cervical Effacement

i. 3 = 0 – 30%
ii. 2 = 40 – 50%
iii. 1 = 60 – 70%
iv. 0 = 80 – 100%

c) Cervical Position

i. 2 = Posterior
ii. 1 = Midline
iii. 0 = Anterior

d) Cervical Consistency

i. 2 = Firm
ii. 1 = Medium
iii. 0 = Soft

e) Head Station

i. 3 = -3, -2
ii. 2 = -1
iii. 1 = 0
iv. 0 = +1, +2

Bishop's Scoring

Bishops score[10] is a pre-induction score which is based on cervical position, consistency, dilatation/hour, effacement, station of presenting part and is assessed at the labour onset. It is said to be favorable if >6. No complications were observed during intra or postpartum period.

Bishop's Scoring: Score	**0**	**1**	**2**	**3**
Cervical Dilatation	Closed	1-2 cms	3-4 cms	5 cms +
Cervical Effacement	< 30%	40 - 50%	60 – 70%	80% +
Consistency Of Cervix	Firm	Medium	Soft	_
Position Of The Cervix	Posterior	Middle	Anterior	_
Head Station	-3	-2, -1	0	+1, +2

Interpretation: Each component is given a score of 0-3. The highest possible score is 13. A score of 5 or less suggests that labour is unlikely to start without induction. A score of 9 or more indicates that labour will most likely commence spontaneously. A low Bishop's score often indicates that induction is unlikely to be successful.

Partogram

A partogram provides a composite record of all the important features of labor on a single sheet. Delay in labor can be detected early by the use of a partogram and timely correction of dysfunctional labour is possible. Many variations of the original partogram are now in use, modified to suit the local circumstances. The WHO partograph has been modified to make it simpler and easier to use. The latent phase has been removed and plotting on the partograph begins in the active phase when the cervix is 4cm dilated.

Intervention

In Group A, patients were treated with prostaglandin E2 (dinoprostone gel) which was administered vaginally to the fornices. Application was done to patients whose cervical dilatation was 2-3cm, less than 30% effaced and cervix posterior in position. The gel containing 0.5 mg dinoprostone per 3gm was packed in a prefilled syringe with a catheter. The syringe comprises of three components, the catheter, the plunger and the barrel. When packed at the factory the plunger is attached to the nozzle of the barrel. The entire assembly was packed in a sealed blister pack. In order to administer the drug it was necessary to assemble the syringe, unscrew the plunger from nozzle of the barrel, screw on the catheter, which is packed separately, on to the nozzle and push the plunger to expel the gel through the catheter. The entire content of the syringe was administered in the posterior fornix. The patient was instructed to remain recumbent for atleast 30 minutes. Next dose was administered after 6 hours, depending on the progress of labour it was repeated for maximum of 3 doses. Vaginal examination was made every 3 hours to note the state of the cervix.

Group B, Patients were treated with *Potaki moola kalka* mixed with *Tila taila*. Application was done to patients whose cervical dilatation was 2-3cm, less than 30% effaced and cervix posterior in position. The patient is instructed to remain recumbent for atleast 30 minutes. The *Lepa* was repeated after 6 hours, depending on the progress of labour. Vaginal examination was made every 3 hours to note the state of the cervix. Maximum of 3 *Lepas* was applied depending upon the progress of labor.

Preparation of *Potaki Moola Kalka*

Two *Moolas* measuring about 10cm long and was washed thoroughly in water to remove the mud, then it was wiped with a cotton cloth to remove the water. It was then pounded in a *Khalwayantra* until a *Slakshna kalka* was obtained. The *Kalka* obtained weighed around 8gms. Autoclaved *Tila taila* was mixed to this *Kalka*. The yoga thus prepared was made *Lepa* on the vaginal fornices.

RESULTS

Table 1: Demographic data

Age		
18 – 20 years	28	46.66%
21 – 23 years	25	41.66%
24 – 26 years	7	11.66%
Religion		
Hindus	47	78.33%
Christians	9	15 %
Muslims	4	6.66%
Education		
Primary	23	38.33%

High School	33	55%
Graduates	4	6.66%
Economic Background		
Poor	18	30%
Lower middle class	42	70%
Occupation		
Homemakers	46	76.66%
Teachers	14	23.33%
Age of Menarche		
12yrs	12	20%
13 yrs	25	41.66%
14 yrs	17	28.33%
15 yrs	6	10%
Rajah srava kala		
3 days	36	60%
4 days	16	26.66%
5 days	8	13.33%
Vedana* in *Rajahkala		
Pain	27	45%
No Pain	33	55%
Diet		
Veg	27	45%
Mixed	33	55%
Prakruti		
Vata pitta	16	26.66%
Pitta kapha	19	31.66%
Vata kapha	25	41.66%
Satwa		
Pravara	28	46.66%
Madhyama	24	40%
Avara	8	13.33%
Fetal position		
LOA (Left Occipito Anterior)	42	70%
ROA (Right Occipito Anterior)	18	30%
Hb%		
10.5-11.4	13	21.66%
11.5-12.4	19	31.66%
12.5-13.4	27	45%
13.5-14.4	1	1.66%

Between Group Results

Table 2: Cervical Dilatation

Time Point	Group	Mean	S.D	S.E.M	Two-way ANOVA For repeated measures (greenhouse-geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	3.00	0.00	0.00	175.648	1.574	111.562	93.180	<0.05
	Group B	3.00	0.00	0.00					
3 hour	Group A	2.87	0.352	0.0908					
	Group B	2.87	0.352	0.0908					
6 hour	Group A	2.33	0.617	0.1593					
	Group B	2.07	0.594	0.1533					
9 hour	Group A	1.60	1.056	0.2726					
	Group B	0.60	0.910	0.2349					
12 hour	Group A	1.00	1.464	0.3780					
	Group B	0.33	0.900	0.2323					

Table 3: Cervical Effacement

Time Point	Group	Mean	S.D	S.E.M	Two-Way ANOVA for Repeated Measures (Greenhouse-Geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	3.00	0.00	0.00	169.781	2.131	79.656	101.661	<0.05
	Group B	3.00	0.00	0.00					
3 hour	Group A	2.73	0.458	0.1182					
	Group B	2.20	0.414	0.1068					
6 hour	Group A	2.13	0.516	0.1332					
	Group B	1.53	0.640	0.1652					
9 hour	Group A	1.07	1.100	0.2840					
	Group B	0.40	0.737	0.1902					
12 hour	Group A	0.93	1.387	0.3581					
	Group B	0.27	0.704	0.1817					

Table 4: Cervical Consistency

Time Point	Group	Mean	S.D	S.E.M	Two-Way ANOVA for Repeated Measures (Greenhouse-Geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	1.73	0.458	0.1182	58.667	2.97	19.73	40.60	<0.05
	Group B	2.00	0.00	0.00					
3 hour	Group A	1.47	0.516	0.1332					
	Group B	1.20	0.414	0.1068					
6 hour	Group A	1.13	0.516	0.1332					
	Group B	0.60	0.737	0.1902					
9 hour	Group A	0.67	0.976	0.252					
	Group B	0.20	0.561	0.1448					
12 hour	Group A	0.53	1.060	0.2736					
	Group B	0.20	0.561	0.1448					

Table 5: Cervical Position

Time Point	Group	Mean	S.D	S.E.M	Two-Way ANOVA For Repeated Measures (Greenhouse-Geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	2.00	0.00	0.00	79.629	2.08	38.17	47.29	<0.05
	Group B	2.00	0.00	0.00					
3 hour	Group A	1.87	0.352	0.0908					
	Group B	2.00	0.00	0.00					
6 hour	Group A	1.73	0.594	0.1533					
	Group B	1.27	0.594	0.1533					
9 hour	Group A	0.93	1.100	0.2840					
	Group B	0.27	0.704	0.1817					
12 hour	Group A	0.80	1.265	0.3266					
	Group B	0.27	0.704	0.1817					

Table 6: Head Station

Time Point	Group	Mean	S.D	S.E.M	Two-Way ANOVA for Repeated Measures (Greenhouse-Geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	3.00	0.00	0.00	188.029	1.688	111.360	70.046	<0.05
	Group B	3.00	0.00	0.00					
3 hour	Group A	3.00	0.00	0.00					
	Group B	2.93	0.258	0.0666					
6 hour	Group A	2.93	0.258	0.0666					
	Group B	2.47	0.640	0.1652					
9 hour	Group A	1.67	1.113	0.2873					
	Group B	0.67	1.113	0.2873					
12 hour	Group A	1.00	1.464	0.378					
	Group B	0.40	1.056	0.2726					

Table 7: Bishop's Score

Time Point	Group	Mean	S.D	S.E.M	Two-Way ANOVA for Repeated Measures (Greenhouse-Geisser)				
					Type III Sum of Squares	df	Mean Squares	F	P
At Admission	Group A	3.00	0.00	0.00	178.048	1.962	90.765	97.515	<0.05
	Group B	3.00	0.00	0.00					
3 hour	Group A	2.80	0.414	0.1068					
	Group B	2.33	0.488	0.126					
6 hour	Group A	2.13	0.743	0.1918					
	Group B	1.33	0.724	0.1869					
9 hour	Group A	1.07	1.280	0.3304					
	Group B	0.27	0.704	0.1817					
12 hour	Group A	0.93	1.387	0.3581					
	Group B	0.27	0.704	0.1817					

Table 8: *Prathama avastha avadhi*

Group	N	Mean	Independent Samples t Test			
			S.D.	S.E.M	T	P
A	15	592.40	441.073	113.884	-0.384	0.005
B	15	644.20	281.088	72.577		

Thirty patients who were in the first stage of labour were included for the study. Demographic data is explained in Table 1. In this study maximum number 28 (46.66%) patients were traced from the age group of 18–20 years, 47 (78.33%) patients were belonging to Hindu community, 33 (55%) patients had their high school education followed by 23 (38.33%) receiving primary education and only 4 (6.66%) were graduated, 42 (70%) patients were belonged to lower middle class and 18 (30%) were from poor class, 25 (41.66%) patients had their menarche at the age of 13 years, 36 (60%) of them had their menstrual flow for 3 days, 16 (26.66%) for 4 days and 8 (13.33%) had the flow for 5 days, 33 (55%) patients had no pain during menstruation whereas 27 (45%) had pain during menstruation, 46 (76.66%) patients were homemakers and 14 (23.33%) of them were working as teachers, tailors etc and 33 (55%) patients were of mixed diet followed by 27 (45%) of patients being vegetarians.

It also included 25 (41.66%) patients of *Vata pitta prakruti*, 19 (31.66%) were of *Pitta kapha prakruti* and 16 (26.66%) were of *Vata kapha prakruti*, among them, 28 (46.66%) patients were of *Pravara satwa* followed by 24 (40%) patients of *Madhyama satwa* and 8 (13.33%) patients were of *Avara satwa*. It was also observed in the present study that maximum number of 27 (45%) patients had Hb% ranging between 12.5-13.4gm%, 42 (70%) had left occiput anterior position and 18(30%) had right occiput anterior position. In Group A 5 (33.33%) patients underwent emergency CS due to uterine hyperactivity and only 1 (6.66%) patient of Group B underwent CS due to failure to progress, 8 (80%) patients in Group A had episiotomy and 11 (78.57%) patients in group B had episiotomy.

Here in this study, *Potaki moola kalka Lepa* was compared with Dinoprostone gel to evaluate its efficacy. Different parameters were employed for the assessment of the result. It showed that the *Potaki moola Kalka* application gave a better result so far as cervical dilatation, cervical effacement, cervical consistency, cervical position, head station and analysis of Bishop's score was concerned and was statistically significant with findings in Group B in comparison to Group A. Results can be found in Table 2 to Table 8.

DISCUSSION

Pregnancy, parturition and puerperium are the three main stages occurring during active reproductive period of a woman's life. Among them parturition is the stage that needs highest attention. Labour is a nature's process. Very often it requires minimal assistance. However, due to altered anatomy and physiology a perfectly normal labour may suddenly become abnormal and even fatal. The present study deals with aiding "a mother to be" woman to pass through a normal labour, unhindered and uncomplicated, without hinderance and without risk to the life of the mother and child.

Here in this study, *Potaki moola kalka Lepa* was compared with Dinoprostone gel to evaluate its efficacy. Different parameters were employed for the assessment of the result. It was found that *Potaki moola Kalka* application gave a better result with the components of Bishop Score such as cervical dilatation, cervical effacement, cervical consistency, cervical position and head station with statistically significant changes in Group B compared to Group A.

The opinions of Ayurveda Aacharyas regarding the onset of labor vary with each other; still all the opinions coincide to conclude that in between 9 and 12 months the labor should take place. *Kaala prakarsha* and *Naadi Vibandha Mukti (Sushruta), Garbha vaasa Vairaagya (Haareeta), Sampoorna Gaatrata (Bhela)* are the causes mentioned for onset of labor. On the basis of clinical features, the process of labor can be divided into five stages: *Prajaayini, Prajananakaalaabhimata, Upasthita prasava, Vishikaantara praveshanam* and *Apara paatana*.

The same is explained in modern obstetrics within the three stages of labor. Virtually all the Ayurvedic classics provide description pertaining to *Prasava Paricharya. Kaashyapa* stresses more on recitation of auspicious hymns to facilitate smooth and uneventful labor, Aacharya also advises intake of meat soup during this period; in the lines similar to *Kaashyapa*, Sushruta also advocates the chanting of auspicious hymns, he also advises the parturient lady to be surrounded by male children and carry in her hand fruits that bear masculine names. Aacharya also stresses on intake of *Yavaagu* prior to labor possibly with the intention in keeping her energy level. Aacharya Charaka opines that *Prasavini* should lie down on the ground on soft beddings possibly to

make her feel comfortable, Aacharya stresses on educating the woman regarding the role she has to play in labor such as to bear down during pain and not to bear down in the absence of pain, Aacharya also advocates the employment of *Mantras*, all these acts can place the woman in a psychologically pleasant and self confident mood which is so very essential for labor to progress. Aacharya Vagbhatta opines similar to Aacharya Charaka and Sushruta and advocates *Yavaagu* with *Gruta* to be consumed by the *Prasavini* before the commencement of labor, Aacharya also advocates inhalation of medicinal smoke during the inter contraction period as well as gentle massage of the flanks with oil. These acts are intended to increase the strength of the contraction and bring in labor that is smooth and safe.

A normal labor passes through three stages; the aim of a competent obstetrician is to see that the woman passes through the three stages uneventfully and delivers a healthy baby safely. In the first stage of labor, duration of the stage plays a very important role since prolonged labor due to ineffective uterine contractions or late ripening of the cervix can have an adverse effect on the mother and the baby. It is equally important that second and third stage also occur within the normal range of time, any gross deviation in the time range definitely indicates some pathology.

The present study was undertaken with a view to bring about safe, effective and enhanced uterine contractions at regular intervals so that the three stages of labor pass off without any complication within the stipulated time period. After a detailed research on the same, we could a find a drug named *Potaki* that is considered to be a safe, less expensive and an effective drug that has been used since centuries in Ayurvedic medicine and this was employed in the present study to evaluate its effectiveness on the first stage of labour.

Lepana is a common form of *Sthaanika chikitsa* or the local treatment, wherein the drugs employed come directly in contact with the part or the structure were an anticipated response is required. Here, *Potaki moola kalka Yoni lepana* was used with the intention of enhancing the dilatation and effacement of the cervix. In the method employed, patients were closely monitored to elicit the exact response to the drugs employed and hence during the first stage of labor p/v examination was carried once in every three hours. Further, the biochemical analysis of *Potaki moola* showed that it is rubeficiant and therefore facilitates effacement and dilatation of cervix and also increases uterine contraction.

The between group comparison yields a significant p value ($p < 0.05$) and showed that there is significant difference between the values taken over five different components of Bishop score for Cervical dilatation, Cervical effacement, Cervical consistency, Cervical position and Head station where, Group B is more effective between the two.

Several studies also have shown the significant results of Ayurvedic medicine with respect to the *Prasava* or the labour. A study done by the Department of Obstetrics and Gynecology- Ayurveda, Benares Hindu University (1989) indicated that the used of *Yoni pichu* and intake of combination of three nutritive herbs-*Ashwagandha*, *Shatavari* and *Gokshur* during pregnancy lead to positive outcomes in terms of the time interval of labour, smooth passage of the foetus, no morbidity and disability in the woman and the baby and their healthy survival. [11]

In a single blind comparative study that was conducted on 45 *Primi* and *Primipara gravida* term pregnancy patients were randomly assigned in three groups of 15 patients each and administered *Eranda taila* orally 30ml, *Matra Basti* 30ml and 2.5IU of oxytocin in 1 pint of RL fluid administered as per the protocol of induction to the respective groups. The outcome measures of the progress in labour were assessed using the standard parameters of Bishop's score and partogram and compared within groups, *Eranda Taila Matra Basti* showed fast progress on all the parameters for delivery with statistical significance in time taken for first stage of labor with p value <0.05. *Eranda taila paana* showed slow and gradual progress and the control group had almost nearer action as *Eranda taila matra basti. Eranda taila matra basti* group showed good results than the other study groups by augmenting the labor and reducing duration of first stage of labor.[12]

In this study, after the administration of *Basti* and *Yonipurana*, highly significant relief was noted in *Katiprishtha Vedana* (100%) and (88.88%) *Udarashoola, Mutrakrichhta* (100%), *Pedal oedema* (100%), *Malabaddhata* (100%) and *Angamarda* (100%) and significant relief was noted in *Gaurava* (92.59%), *Suptata* (81.81%) and *Daurbalya* (66%). Spontaneous onset and timely delivery (EDD) was found in all cases. The study showed that the proper administration of *Basti* with *Dashamoola Taila+ Vasadi Kwatha, Yonipurana* with *Eranda Taila* after completed 8th month of pregnancy reduced the duration of labour and associated complications.[13]

In the study of Anu *et al*, *Shatavaryadi Ksheerapaka Basti* (medicated enema prepared along with milk) was administered in a 28 year old second gravida patient of 33 weeks gestation with premature contractions, wherein isoxsuprine hydrochloride

proved to be ineffective. Per-rectal *Basti* with 450ml *Shatavaryadi Ksheerapaka* administered for 2 consecutive days was found to be effective in preventing the uterine contractions and further advancement to preterm labour. The drugs in *Shatavaryadi Ksheerapaka Basti* possess antioxytocic and vasodilating properties which may effectively curtailed the progress of premature contractions.[14]

A clinical study was conducted in 100 primipara patients to rule out efficacy of *Shatavari* (Asparagus Racemosus) *taila* (oil) *Anuvasan basti* and *Pichu*. According to Ayurveda, *Apana Vayu* (one type of *Vata*) is mainly responsible for normal labour. *Shatavari taila* is *Madhura*, *Vatashamak* and *Anulomak* and also has demulcent action. Due to these properties, *Taila basti* was effective in maintaining *Vata dosha* equilibrium and *Apana vayu's* normal *Anuloma gati* (downward direction) and *Pichu* caused local lubrication of birth canal which facilitated cervical dilatation, effacement and fetal expulsion. Out of 100 primi para, 95 delivered normally and 5 needed caesarean section. Also, significant results were observed regarding total labour duration, necessity for labour induction and augmentation, intensity of uterine contractions, Bishop' score and progress in overall labour process. Thus from above study it can be concluded that *Shatavari taila anuvasan basti* and *pichu* are helpful in maintaining normal *Apana gati* as well as pacification of local and generalized *Vata shaman*. Thus this antenatal treatment is effective in normal vaginal delivery with no complications.[15]

In Pal *et al* study, selected pregnant women were randomly divided in two group Group A was given *Madhur ausadh siddha tail Anuvasan vasti* twice weekly and *Pichu* daily in ninth month and in Group B, *Sukhprasavkar yoga* was given 3gm bid daily. There were significant reduction in time taken in different stages of labour, reducing episiotomy and reduced rate of caesarean sections in Group A compared to Group B. Group A was also found more effective than Group B in various other subjective and objective parameters. The drugs used in both the groups were effective without any side effects. There was marked effect on LSCS in Group A in which *Anuvasanbasti* with *pichu* was given than Group B in which only *Sukhprasavkar yoga* was given. There was marked reduction in duration of stages of labour in Group A than Group B. Thus it can be concluded that Group-A was more effective than Group-B in various factors such as rupture of membrane, nature of onset of labour, duration of labour, perineal tear, *Vibandha*, *Udarshoola*, *Katishoola*, *Dourbalyata*, *Kshudha-vaishmya*, *Nidra-vaishmya*, and P.P.H.[16]

As the previous studies, the present study has also shown the significant changes in the Bishop's score at the first stage of labour. On chemical analysis, *Potaki moola* was found to have carbohydrates, pentose sugars, proteins, and steroids thereby positively contributing towards the energy requirement and health of the cervix. Pentose sugar is a source of ready supplement as far as energy is concerned. *Potaki moola* also contains Calcium, Magnesium, Potassium and Amino acids all which contributes towards maintaining the ideal micronutrient balance in the reproductive tract. Calcium also enhances the ability of the uterus to contract more effectively. Apart from the efficacy it was also found that safety of *Potaki moola* was far superior to the Dinoprostone gel. It was found that significant group of patients (33%) treated with Dinoprostone gel were forced to be taken for emergency CS due to in-coordinate uterine contractions. However, such adverse effects were not seen with *Potaki moola* application.

Strengths of the study

Storage issue encountered with Dinoprostone gel was not seen in *Potaki moola Kalka*. No adverse effects were seen with *Potaki moola* application.

Limitations of the study

A smaller sample size, longer follow up could not be done.

Recommendations for Future study

A larger study can be conducted with larger sample size with longer follow up at different centers so that these valuable Ayurvedic medicines can be employed for the welfare of society in the days ahead.

CONCLUSIONS

Potaki moola kalka application showed statistically significant results in cervical dilatation, cervical effacement, cervical position, cervical consistency and head station of Bishop's score at the first stage of labor compared to Dinoprostone gel application.

REFERENCES

1. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Lancet. 2016; 387 (10017): 462-74.
2. Meenakshi Pal, Sushila Sharma, B. Pushpalatha, K. Bharathi. A Scientific Approach to Prasava Prakriya (Labour) an Ayurvedic View. International Journal of Ayurveda and Pharma Research. 2015;3 (10):1-6.

3. Lauzon L, Hodnett E. Antenatal education for self-diagnosis of the onset of active labour at term. Cochrane Database Syst Rev. 2000; 2:CD000935.
4. Chelmow D, Kilpatrick SJ, Laros Jr RK. Maternal and neonatal outcomes after prolonged latent phase. Obstet Gynecol. 1993;81(4):486–91.
5. Maghoma J, Buchmann EJ. Maternal and fetal risks associated with prolonged latent phase of labour. J Obstet Gynaecol. 2002;22(1):16–9.
6. Hemminki E, Simukka R. The timing of hospital admission and progress of labour. Eur J Obstet Gynecol Reprod Biol. 1986;22(1–2):85–94.
7. Holmes P, Oppenheimer LW, Wen SW. The relationship between cervical dilatation at initial presentation in labour and subsequent intervention. BJOG. 2001; 108(11):1120–4.
8. Jackson DJ, Lang JM, Ecker J, Swartz WH, Heeren T. Impact of collaborative management and early admission in labor on method of delivery. J Obstet Gynecol Neonatal Nurs. 2003;32(2):147–57. discussion 158–160.
9. Klein MC, Kelly A, Kaczorowski J, Grzybowski S. The effect t of family physician timing of maternal admission on procedures in labour and maternal and infant morbidity. J Obstet Gynecol Can. 2004; 26(7):641–5
10. Hiralal Konar, D.C.Datta's Textbook of obstetrics, 8th edition, chapter 35 Induction of labour, Jaypee Brother's Medical Publishers(P) Ltd., Reprint 2016, pg 600.
11. Smita Bajpai. Role of Ayurveda in Promoting Maternal and Child Health. Anc Sci Life. 2008 Jul-Sep; 28(1): 16–20.
12. Ambalgekar S, KV Mamatha. A Clinical Study in Evaluating the Efficacy of Eranda Taila for Augmentation of Labor. J Adv Res Ayur Yoga Unani Sidd Homeo 2016; 3: 5-14.
13. Rajkrinti, Laxmipriya Dei and Dr. Jaideep Gothwal, 2017. "A clinical study on effect of Basti and Yonipurana in the management of, 9, (09), 57784-57787.
14. M.S.Anu, Suprabha Kunjibettu, S. Archana, and Laxmipriya Dei. Management of premature contractions with Shatavaryadi ksheerabasti– A case report. Ayu. 2017 Jul-Dec; 38(3-4): 148–152.
15. Ashwini Narayan Karandikar. A clinical study to evaluate the efficacy of Shatavari taila anuvasan basti and pichu in 9th month of pregnancy in normal labour. Int. J. Res. Ayurveda Pharm. 2017; 8(4):33-35.
16. Pal et al. Role of Anuvasanvasti With Pichu & Sukh Prasavkar Yoga In Pregnancy on Progress Of Labour. World Journal of Pharmaceutical Research. Vol 5, Issue 4, 2016.

Cite this article as:
Shreyes. S, Vandana. S. Kulkarni, Jyothi. S. Kanagali, Yogitha Bali M.R. Role of Potaki Moola Kalka Lepana in Prasava (1st Stage of Labour)- A Comparative Study. International Journal of Ayurveda and Pharma Research. 2020;8(2):15-24.

Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**
Dr. Yogitha Bali M.R
Professor,
Dept of Shalya Tantra,
Sushrutha Ayurvedic Medical College, Bangalore,
Email: baliyogitha@gmail.com
Mob: 9886948511